CHAPTER 4—DETERMINING AND REPORTING EMISSIONS

This chapter gives general information about required emissions data, acceptable emissions determination methodologies, speciating emissions (categorizing emissions by chemical species), and correctly reporting annual emissions, ozone season emissions, and emissions due to emissions events and scheduled maintenance, startup, and shutdown activities. For more detailed information about determining emissions from internal and external combustion sources, cooling towers, equipment leak fugitive components, flares, marine operations, and aboveground storage tanks, consult the appropriate technical supplement (Appendix A).

Required Emissions Data

If a site meets the reporting requirements of 30 TAC 101.10, all actual emissions for each regulated pollutant must be reported in the emissions inventory. For the purposes of this document, the term *regulated pollutant* shall include the following:

- any VOC, as defined in 30 TAC 101.1;
- any pollutant subject to federal Clean Air Act (FCAA) Section 111;
- any pollutant listed as a hazardous air pollutant under FCAA Section 112;
- each pollutant that has a national primary ambient air quality standard; and
- any other air pollutant subject to requirements under TCEQ rules, regulations, permits, orders of the commission, or court orders.

Non-criteria, regulated pollutants include—but are not limited to—ammonia and H_2S.

Acceptable Determination Methodologies

Many different methods exist to determine emissions. To ensure accuracy and consistency, the TCEQ accepts only a limited number of determination methodologies, issues specific guidance on their use, and further requires that all emissions be determined using the best methodology available for EI purposes. Determination methodologies other than those listed below must not be employed without the TCEQ’s prior approval.

Depending on the type of emissions source, the methodology preference will often vary. The acceptable methodologies are discussed in alphabetical order and are labeled with a relevant heading (for example, stack testing is discussed under “Measured Data”). Regulated entities must not use a less preferred determination methodology to determine inventory emissions if valid data from a preferred determination methodology exist.

If emissions data from multiple determination methodologies exist for a given emissions source, and a regulated entity believes that data from a less preferred determination methodology more accurately represents the source's emissions than data from a more preferred methodology, the regulated entity must present its argument in writing to the TCEQ and request that the agency review and approve the exception to the order of preference outlined in this document. The TCEQ reserves the right to disapprove such requests and to determine which methodology more accurately represents a source's emissions for EI purposes.

Note: Emissions must be determined and reported from all sources, including those that are not included in an EPA document such as AP-42. The best method available must be used to determine emissions in these cases.

Preceding each heading is a single letter, such as "A" or "V," the code to be entered on the EIQ when using that emissions determination methodology. These codes must be entered under the heading "Method" for each reported contaminant. Each contaminant listed on the EIQ can only have one corresponding code entered under "Method," and this code must represent how the emissions of that contaminant were determined.

Source-Specific Determination Methodologies

For information about the preferred emissions determination methodology or methodologies for a specific source type, consult the appropriate technical supplement (Appendix A), or call the EAS help line.

If a preferred method does not apply to a given source, or its use would misrepresent the source's emissions, contact the EAS for approval of an alternate methodology.

D: Continuous Emissions Monitoring Systems

Continuous emissions monitoring systems (CEMS) generate real-time emissions data 24 hours per day. Note that portable analyzers are not CEMS. If CEMS are properly calibrated and operated, they offer the best means of determining a source's emissions in most situations.

Please note that a continuous monitoring system (CMS) that measures the gas composition of a process stream and does not quantify emissions released to the atmosphere is not a CEMS. Therefore, the emissions determined from CMS would not be coded with a determination methodology of "D" for 'continuous emissions monitoring system.' Instead, a determination methodology of "B" for 'material balance' is correct.

Supply a representative set of summary sheets from Relative Accuracy Test Audits performed during the EI calendar year. If NO_x emissions are determined using CEMS, note the molecular weight used in the data logger. Since the calculation is based on NO_2 by convention, a molecular weight of 46.01 must be used to determine NO_x emissions. If a CEMS is inoperative for any part of the EI calendar year, other data may be used to determine emissions during CEMS downtime, provided that the data substitution method is allowed by state or federal regulation and is well-documented in the EI and its supporting documentation. However, if valid CEMS data are available, they must be used to determine emissions.

H: Highly Reactive Volatile Organic Compound (HRVOC) Monitoring Systems

HRVOC monitoring required by 30 TAC 115.725–115.726 involves a continuous monitoring system that measures the gas composition of a waste stream and does not directly quantify emissions released to the atmosphere. Emissions determined from the data generated by these systems are coded “H.”.

HRVOC monitoring systems not required by 30 TAC 115.725–115.726 must not be coded “H” but as “B” for ‘material balance.’ Similarly, a CMS for compounds other than HRVOCs is coded “B.”

If a CMS is inoperative for any part of the EI calendar year, other data may be used to determine emissions during CMS downtime, provided that the data substitution method allowed by state regulation and is well documented in the EI and the supporting documentation.

For cooling towers, emissions data from a HRVOC monitoring system required by 30 TAC 115.764 must be coded “H.” For more details, please see Technical Supplement 2.

F: Predictive Emissions Monitoring Systems

Predictive emissions monitoring systems (PEMS) predict real-time emissions data continuously. Since correct calibration and operation are critical to system performance, PEMS may be used to determine emissions only if they have been certified according to EPA or TCEQ standards.

Supply a representative set of summary sheets from relative accuracy test audits performed during the EI calendar year. If NO_x emissions are determined using PEMS, provide the molecular weight used in the data logger. As with CEMS, the a molecular weight of 46.01 must be used to determine NO_x emissions.

If a PEMS is inoperative for any part of the EI calendar year, other data may be used to determine emissions during PEMS downtime, provided that the data substitution method is well documented in the EI and the supporting documentation.

M: Measured Data (Stack Sampling Data)

Stack testing is a formal, structured event coordinated with the appropriate TCEQ regional office. Testing conducted using a Draeger tube, fuel gas analysis, or fuel flow measurement does not qualify as stack testing because the data obtained from these types of tests produce emission rates that are considered engineering estimates.

While properly performed stack testing can provide valuable information about a source's operation, improperly performed testing may grossly misrepresent a source's emissions. For this reason, the TCEQ requires that all stack-test data used to determine emissions be collected using methods approved by the EPA or the TCEQ.

If a unit is modified, or its operating conditions or associated process parameters change significantly such that previous stack test results no longer accurately reflect the unit's emissions, the TCEQ requires that a more appropriate method be used to recalculate emissions determinations.

Stack test results must be based on process rate data. If the results are reported as a lb/hour rate, use the factor and the process rate at the time of testing to obtain a process-based emissions rate. For example, for combustion sources, divide the lb/hour emission rate by the MMBtu/hour fuel usage rate to obtain a factor with units of lb/MMBtu. Similarly, for cement kilns, divide the lb/hour emission rate by the tons of clinker/hour to obtain a factor with units of lb/ton of clinker.

If identical sources with similar emissions are located at the same site but stack-test data are available for only one of them, the TCEQ may approve the use of the tested source's emission factors to determine emissions from the other identical facilities. In these cases, only the tested source's emissions are coded "M" for 'measured.' The other related sources' emissions are coded "E" for 'estimated,' because these facilities were not actually tested.

The TCEQ will also consider, case by case, the validity of using stack-test emission factors generated for one source at a site to determine emissions from identical facilities at another site. In these cases, only the tested source's emissions are coded "M." The other related facilities' emissions are coded "E," because these facilities were not actually tested.

The TCEQ requires the most recent representative stack-test data be used to determine emissions. To be considered representative, stack test data must reflect current operations and processes including control equipment. The use of historical stack-test data is acceptable, provided that the equipment is operating within the same parameters and under the same conditions that were in place at the time of the test. If a unit is tested every year, use the most recent year's stack test results to determine emissions. If the unit is tested multiple times within a calendar year, average the most recent calendar year's test results to determine emissions. Due to process variations as well as fuel variations, stack-test data from multiple calendar years must not be averaged to determine emissions. Stack-test data from a current year must not be used to determine emissions for previous years.

By signing the front page of the Emissions Inventory Questionnaire and submitting the document to the TCEQ, the owner or operator certifies that all test data used are certified as accurately representing the site's emissions.

If NO_x emissions are determined from stack sampling data, use a molecular weight for NO_x of 46.01 when converting from parts per million to report the mass emission rate of NO_x.

Q: Portable Analyzer Measurement Data

The TCEQ prefers properly performed, representative, periodic emissions measurements using a portable analyzer instead of vendor or AP-42 factors (see below).

While accurate portable analyzer measurements can provide valuable information about a source's operation, improper measurements may grossly misrepresent a source's emissions. For that reason, the TCEQ requires that all test data used to determine emissions be collected using methods approved by the EPA or the TCEQ.

Portable analyzer measurements must be taken during conditions that reflect the actual routine operation of the unit. If a unit is modified, or its operating conditions or associated process parameters change significantly, previous measurements will no longer accurately reflect the unit's emissions and the TCEQ requires that a more appropriate method be used to recalculate emissions.

Measurement results must be based on process rate data. If the results are reported in lb/hr, use the factor and the process rate at the time of testing to obtain a process-based emissions rate. For example, for combustion sources, divide the emission rate in lb/hr by the fuel usage rate in MMBtu/hr to obtain a factor with units of lb/MMBtu.

If a source is tested more than once a year, account for this in the emission determination. For example, if a source is tested quarterly, apply the emissions factors appropriately to determine emissions for each quarter. Averaging test results may or may not be appropriate, depending on source operation. If there are multiple test results for a calendar year, do not select one test result to determine emissions for the entire year.

By signing the front page of the Emissions Inventory Questionnaire and submitting the document to the TCEQ, the owner or operator certifies that all measurements included accurately represent the source's emissions.

When using portable-analyzer measurements to determine NO_x emissions, use a molecular weight for NO_x of 46.01 when converting from parts per million to report the mass emission rate of NO_x.

V: Vendor-Supplied Emissions Factors

Many manufacturers of industrial equipment supply emissions information for their products. These data, based on testing, are developed for a particular piece of equipment and, if applicable, for a particular unit size. Vendor data may be used to determine emissions only if they are based on approved stack testing and if no significant modifications have been made to the equipment. A modification to a unit or its operation, including a significant change in fuel characteristics, may significantly affect the unit’s emissions and therefore invalidate the manufacturer’s emissions data.

Include a copy of the manufacturer’s data with the supporting documentation. In signing the front page of the EIQ and submitting the document to the TCEQ, the owner or operator certifies that the unit was operated in the same manner in which it was tested.

A: AP-42 and Other EPA- or TCEQ-Approved Factors

The EPA’s *Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources* (AP-42), with supplements (updated continually)—available at <www.epa.gov/ttn/chief/ap42/>—includes brief discussions of various industrial processes, descriptions of these processes’ emissions, and emission factors useful for determining these emissions. Equipment emission factors have generally been determined by testing a representative population varying in size and age.

The EPA is working to improve the quality and quantity of the AP-42 factors. When factors are revised, the new factors wholly replace the older factors for emissions inventory reporting. When using a published factor from the EPA or the TCEQ, use the most recent factor as of the end of the calendar year for which the emissions inventory is being prepared. A factor published after the end of the EI calendar year may not be used to determine emissions from a source for that calendar year or previous calendar years.

Emissions determined using tools other than AP-42 factors may still be coded with a determination methodology of “A” if the determinations were based on EPA- or TCEQ-approved programs or factors. Examples include emissions determined using the TANKS and WATER9 software programs and component fugitive emissions determined using factors published in the EPA’s *Protocol for Equipment Leak Emissions Estimates* (EPA-453/R-95-017).

B: Material Balance

Material balance can only be performed for specific types of sources whose processes are well understood and relatively simple (for example, surface coating or parts cleaning). Emissions determinations must be based on process rates and material quantity and composition. Guidance on determining emissions from several process types may be found in AP-42 or in various TCEQ guides to air permitting; see Appendix C for a list of helpful EPA and TCEQ resources.

Certain methodologies for determining emissions may be labeled “material balance” even if those methodologies incorporate analytical measurements. A TCEQ-approved program for monitoring cooling towers, an extended inlet gas analysis from a glycol still for use in GRI GlyCalc, or a continuous monitoring system used to determine flow rate and composition of gas routed to a flare measures the physical properties of the process stream and does not measure the emissions released to the atmosphere. Therefore, emissions determination methodologies that use such measurements are labeled “B,” since the results of the measurements are used in emissions equations.

S: Scientific Calculation

For the emissions inventory, the use of first-order engineering principles (for example, thermodynamic equations or the ideal gas law) constitutes a scientific calculation. Use of process rate data in conjunction with AP-42 or vendor-supplied emission factors, like simple use of a calculator to multiply or add values, does not constitute a “scientifically calculated” emissions determination.

E: Estimation

If the EPA or the TCEQ has not published guidance on determining emissions for a particular source, and if a more preferable emissions determination method (as discussed in this chapter) is not available, emissions should be determined using an engineering estimate. Any such estimate must be the best possible, given the available data, and must be accompanied by enough supporting documentation to allow the TCEQ to logically understand how the estimation was made. If the TCEQ determines that an estimation is unfounded, then the TCEQ will require that emissions be recalculated.

O: Other

If the EPA or TCEQ has not published emissions determination guidance for a particular source, and if a preferable emissions determination method (as discussed in this chapter) is not available, it may be acceptable to use factors developed by an industry group. When using such factors, code the associated emissions with a determination methodology of “other.”

Note that certain industry-published software programs, such as GRI GlyCalc, use emissions determination methodologies that are more appropriately coded with methodologies besides “O.” For example, GRI GlyCalc uses site-specific analytical measurements input into material balance equations to determine glycol still emissions. Therefore, GRI GlyCalc emissions determinations are coded “B.”

E&P TANK is used to calculate working, breathing, and flash losses from storage tanks. E&P TANK uses the Peng-Robinson equation of state to determine flash emissions, and can determine breathing and working loss emissions using AP-42 or similar equations and factors. However, E&P TANK emissions determinations are coded “O,” since flash losses typically account for the majority of tank emissions.

When using industry group guidance, carefully check emissions determination methodologies to ensure there is no code more appropriate than “O.” Additionally, if the TCEQ determines that an emissions determination is unfounded, then the TCEQ may require recalculation of emissions.

Choosing a Determination Methodology when More than One Is Used for a Contaminant

When more than one methodology is used to determine emissions for a contaminant, use the code that represents the majority of the emissions. When determining emissions from a storage tank with flash emissions for example, if the working and breathing losses are calculated using the TANKS 4.09D software (determination methodology “A”) while the flash losses are calculated using the gas/oil ratio method (determination methodology “B”), the total emissions reported in the EI are coded “B,” assuming the flash losses are greater than the working and breathing losses.

When a control efficiency is applied to an emissions factor, the methodology that corresponds to the emissions factor must be used. For example, if the VOC emissions for a compressor engine are determined using the AP-42 Section 3.2 factor (determination methodology “A”) with a vendor control efficiency (determination methodology “V”) applied, the total VOC emissions reported in the EI are coded “A.”

When a ratio of AP-42 factors—or others, such as industry factors—is used to speciate total VOC emissions that are determined using stack test data or vendor data, report the determination methodology as “S” for the speciated emissions; report the VOC—u emissions using the appropriate code for the determination method (e.g., “M” or “V”).

Determining Methodologies for a Hypothetical Source

A turbine has CEMS installed to measure NO_x and CO. Additionally, stack testing, conducted in coordination with the appropriate TCEQ regional office, has measured SO_2 emission rates for this same turbine. CEMS data must be used to determine NO_x and CO emissions, which are then coded on the EIQ with a determination methodology of “D.” Since the turbine has no CEMS or PEMS in place to measure SO_2, the data from the stack test mentioned previously must be used to determine SO_2 emissions; those resulting emissions are coded “M.” For all other expected contaminants—including, but not limited to, total PM, PM_{10}, $PM_{2.5}$, and VOC—the best available determination methodologies must be used, and these emissions coded appropriately. For more information on preferred determination methodologies for turbines, please consult “Technical Supplement 1: Select Combustion Sources” in Appendix A.

Minimum Detection Limits

Certain source-specific methods listed in the preceding sections, such as measured data or material balance, use analytical measurements to determine emissions. Analytical test methods can indicate that measurements of a contaminant likely to be present in an emissions stream are below either the analytical method’s minimum detection limit or its reporting limit. However, such a finding is not equivalent to a finding that the contaminant is absent from the emissions stream.

Therefore, if measurements of a contaminant likely to be in an emissions stream are below the minimum detection limit or reporting limit (that is, non-detected), then half of the detection or reporting limit must be used to determine the emissions, unless otherwise specified by permit condition, TCEQ or federal rule, or commission order.

General Order of Preference

If a source-specific order of preference for determination methodologies is not provided for a given source (see technical supplements in Appendix A), the general order of preference listed in Table 4-1 must be followed.

Using Factors from a Permit

Do not list a permit as a factor's source. If the same factor is used to determine emissions for the EI as was used in a permit application, then the EI must disclose the origin of the factor (for example, vendor data or AP-42). The emission factor used to obtain a permit must not be used in estimating the emissions in the inventory, if any of the following applies:

- If the permit factor came from a document such as AP-42 and the factor has been revised—instead, the most recent version of that factor must be used.
- If testing was conducted or continuous monitoring implemented at a site after the TCEQ issued a permit for that site—instead, the resulting data must be used.
- If a source's permit no longer reflects the conditions of its actual operations.

Rates reported on the EIQ must represent actual emissions, rather than maximum potential emissions.

Table 4-1. General Order of Preference for Emissions Determination Methodologies (to Be Used Only in the Absence of Source-Specific Guidance)

D (Continuous emissions monitoring system or CEMS)
H (HRVOC monitoring system)
F (Predictive emissions monitoring system or PEMS)
M (Measured—stack test data)
Q (Portable analyzer test data)
V (Vendor-supplied emissions factors)
A (AP-42 and other EPA-approved factors)
B (Material balance)
S (Scientifically calculated)
E (Estimated)
O (Other)

Speciating Emissions

Once the emissions from each source at the site have been determined, the owner or operator must specifically identify and quantify individual chemical substances, or species, within each emission category. This process is known as *speciation*. This section offers only a brief overview of speciation requirements. For more information about emissions speciation for a particular source, consult the appropriate technical supplement (Appendix A), or contact the EAS.

Speciating VOCs

VOC speciation requirements depend on a site's geographic location. If the site is in El Paso County or east of the 100° longitude line (see map on page 9), the VOCs must be speciated from each source emitting at least 5 tons of VOCs annually. If the site is located west of the 100° longitude line (except for El Paso County), the VOCs must be speciated from each source emitting at least 25 tons of VOCs annually. For each source that meets these requirements, speciate VOC emissions to at least 90 percent of the total VOC emissions reported for each source. If any speciated contaminant was emitted at a level below 0.1 ton, the emissions must be reported for that contaminant under *VOC—unclassified* (contaminant code *50001*). Special speciation requirements apply to lead compounds and HAPs listed in any TCEQ-enforceable document such as a permit, regulation, or commission order. *Please note:* a registered permit by rule that includes a certification of federally enforceable emission limits (e.g., using Form PI-7-CERT, designated form TCEQ-20182) is a TCEQ-enforceable document.

Each emitted substance (for example, carbon monoxide or benzene) must be identified by a unique five-digit number known as the contaminant code. It is very important that each emission rate be reported under the most accurate contaminant code available. For example, benzene must be reported under the benzene-specific code (*52420*) rather than under the general VOC code (*50001*).

A complete list of contaminant codes can be found on the EAS Web page at <www.tceq.texas.gov/goto/ieas>. The TCEQ attempts to ensure that the list is complete and accurate. If there is no code listed for the contaminant in question, contact the EAS for assistance. If possible, be prepared to provide the compound's Chemical Abstracts Service (CAS) number to aid in identification. Note that the contaminant code *50000*, unspeciated hydrocarbons, is no longer in use.

To obtain a *VOC—unclassified* (contaminant code *50001*) total, subtract all speciated VOCs from the total VOC number. The following example clarifies VOC reporting requirements.

Example: A fugitive area located east of 100° longitude emitted 10 tons of VOCs. Based on the VOC weight percentages obtained using a site gas analysis, the released contaminants are determined to be:

- propane (60%)
- butane (8%)
- isobutane (7%)
- pentane (7%)
- isopentane (6%)
- hexane (4%)
- heptane (3%)
- individual VOCs occurring in such small amounts that they cannot reasonably be separated (5%)

Table 4-2 shows how to report these emissions.

Table 4-2. Example of Speciated VOC Emissions

Contaminant Code	Contaminant	Actual Emissions (tpy)
50001	VOC—unclassified	0.5
56775	propane	6.0
56725	butane	0.8
56625	isobutane	0.7
56750	pentane	0.7
56700	isopentane	0.6
56600	hexane	0.4
56575	heptane	0.3

Notice that the total VOC emissions of 10 tons are not explicitly shown in the EIQ. The STARS database will automatically sum the reported VOCs for each source to obtain the total VOC number (previously reported under contaminant code *59999*). Do not report the total 10 tons of VOC emissions under contaminant code *50001* and then report the speciated emissions shown in Table 4-2, because STARS will then arrive at a total VOC emission rate of 19.5 tons for this source, resulting in an overreporting of 9.5 tons of emissions.

Speciating Hazardous Air Pollutants and Other Compounds of Interest

Hazardous Air Pollutants (HAPs)

HAPs are air pollutants designated as hazardous by the EPA and are identified in federal Clean Air Act 115(b). Speciate all HAPs that are emitted from any source at or above 0.1 ton per year. Additionally, for HAP emissions authorized by any TCEQ enforceable document such as a permit, regulation, or commission order, speciate these emissions at or above 0.001 ton per year. If aggregate HAPs are listed in any TCEQ-enforceable document such as a permit, regulation, or commission order, each individual HAP must be speciated. *Please note:* a registered permit by rule that includes a certification of federally enforceable emission limits (e.g., using TCEQ form PI-7-CERT) is a TCEQ-enforceable document.

Chemical Mixtures

For certain chemical mixtures such as condensate or gasoline, quantify and speciate the HAPs, list each HAP under the appropriate contaminant code, and report the balance of the emissions under the chemical mixture's contaminant code, such as 59090 (for condensate) or 59003 (for gasoline). For speciation guidance on other complex contaminants, contact the EAS.

Toxic Compounds

Toxic compounds are chemicals that are designated as toxic by the EPA. Toxic chemicals are identified in 40 CFR 372.65. Speciate all toxic compounds, particularly if they were emitted from any source at or above 0.1 ton per year.

Toxic compounds reported in the Toxics Release Inventory (TRI) must be reported in the EI. If there are discrepancies in reporting between the TRI and EI, please include an explanation in the supporting documentation.

Lead and Mercury

Note the source reporting requirements when determining and reporting lead and mercury emissions. The TCEQ is requiring that all regulated entities report lead and mercury emissions from any source that emits more than 0.001 ton of either lead or mercury per year.

Highly Reactive Volatile Organic Compounds (HRVOCs) and Compounds of Interest (COIs) for Nonattainment Counties

In an ozone nonattainment county, speciate each of the following chemicals, particularly if they were emitted from any source at or above 0.1 ton:

- ethylene
- propylene
- isoprene
- 1,3-butadiene
- all isomers of butene (all isomers of butylene)
- all isomers of pentene
- all isomers of trimethylbenzene
- all isomers of xylene
- all isomers of ethyltoluene

Speciating Particulate Matter

PM, PM_{10}, and $PM_{2.5}$

Particulate matter is a collective term used for any material, except uncombined water, that exists as a solid or liquid in the atmosphere or in a gas stream at standard conditions. While individual particles may not necessarily be seen with the naked eye, collectively they can appear as black soot, dust clouds, or gray hazes.

Since a particle's transport characteristics and its potential health effects may depend on its size, the EPA has promulgated national primary and secondary air quality standards concerning two subsets of fine (small) particulate matter: PM_{10} and $PM_{2.5}$.

PM_{10} is defined as the portion of PM that has an aerodynamic diameter less than or equal to 10 microns. Therefore, PM_{10} is a subset of PM by definition. Most PM is composed of a certain percentage of PM_{10}; that is, a certain percentage of PM comprises particles less than or equal to 10 microns in diameter, while the remaining percentage comprises larger particles. Therefore, when reporting PM, also report PM_{10}, unless the owner or operator can document that all PM is greater than 10 microns in diameter.

$PM_{2.5}$ is defined as the portion of PM that has an aerodynamic diameter less than or equal to 2.5 microns. Therefore, $PM_{2.5}$ is a subset of PM and PM_{10} by definition. For many sources, $PM_{2.5}$ constitutes a certain percentage of PM. For example, sources that combust natural gas emit particulate matter less than 1 micron in diameter. Thus, all particulate matter emitted from natural gas combustion is not only $PM_{2.5}$ (since it is smaller than 2.5 microns in diameter), but also PM and PM_{10}, since $PM_{2.5}$ is a subset of PM and PM_{10} by definition.

Particle Size Distribution

The percentages of PM_{10} and $PM_{2.5}$ that constitute a source's PM are often referred to as a particle size distribution. Source-specific, EPA-approved testing is the best method available to determine particle size distribution for a particular emissions source. If test data are not available, process knowledge—including manufacturers' data—may help determine a source's particle size distribution. AP-42 also contains particle size distributions for certain sources.

Reporting and Speciating Particulate Matter

All particulate matter emissions must be reported regardless of size as PM under the *1xxxx* series of contaminant codes. Since PM is defined as all particulate matter (that is, there are no size restrictions on PM), even the portion of PM that is PM_{10} and $PM_{2.5}$ must be reported under the *1xxxx* contaminant code series. Similarly, all particles with an aerodynamic diameter less than or equal to 10 microns must be reported as PM_{10} under the *2xxxx* contaminant code series, even if a portion of these particles can be considered $PM_{2.5}$. Note that, since PM_{10} and $PM_{2.5}$ are subsets of PM, representing particulate matter as PM, PM_{10}, and $PM_{2.5}$ does not result in repeated counting of the emissions.

When determining PM emissions, both filterable and condensable emissions must be determined and reported in the emissions inventory. If total particulate matter emissions have been stack tested for a particular source, reported particulate matter must adhere to the applicable definitions in 30 TAC 101.1. If only filterable particulate emissions have been measured from a source, please contact the EAS for assistance.

To speciate particulate matter, follow these guidelines:

- report all speciated particulate emissions under the appropriate *1xxxx* contaminant code,
- list the remaining unspeciated particulate emissions under the contaminant code *10000*,
- report the portion of the particulate emissions with an aerodynamic diameter of 10 microns or less (PM_{10}) under a *2xxxx* contaminant code,
- list the remaining unspeciated PM_{10} emissions under contaminant code *20000*, and
- report the portion of the particulate emissions with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$) under contaminant code *39999*.

Example: A source emitted 10 tons of particulate matter. The matter is determined to have been mostly phosphorus (75 percent) and zinc (16 percent), with the remaining 9 percent of unknown composition. The phosphorus and zinc particles are larger than 2.5 microns, but smaller than 10 microns, in aerodynamic diameter. The other 9 percent of particles are believed to be larger than 10 microns in aerodynamic diameter. The emissions in this example must be reported as shown in Table 4-3.

Table 4-3. Example of Speciated Particulate Matter Emissions

Contaminant Code	Contaminant	Actual Emissions (tpy)
10000	Part—unclassified	0.9
14460	phosphorus	7.5
14780	zinc	1.6
20000	PM_{10}—unclassified	0
24460	PM_{10} phosphorus	7.5
24780	PM_{10} zinc	1.6
39999	total $PM_{2.5}$	0

Notice that the total particulate number (10 tons) and the total PM_{10} number (9.1 tons) are not explicitly listed in this report. Once again, the STARS database will sum all of the appropriate individual contaminants to obtain these numbers. Verify that the sum of the emission rates reported in the entire 10000 series of contaminants represents the intended total particulate emission rate, and that the sum of the emission rates reported in the entire 20000 series of contaminants represents the intended total PM_{10} emission rate.

Speciation Criteria Summary

Table 4-4 summarizes the criteria for speciating emissions.

Table 4-4. Summary of Speciation Criteria

Contaminant	Applicable Counties	If the emissions at the FIN/EPN path satisfy the tpy limit listed below, report or speciate the actual emissions.
Lead (Pb)	All counties	≥ 0.001
Mercury (Hg)	All counties	≥ 0.001
HAPs[a] listed in any TCEQ-enforceable document	All counties	Speciate HAPs ≥ 0.001when the contaminant is listed in any TCEQ enforceable document such as a permit, regulation, or commission order.[b] If aggregate HAPs are listed in any TCEQ enforceable document such as a permit, regulation, or commission order, then each individual HAP must be speciated.
All other HAPs[a]	All counties	≥ 0.1
Toxics[c]	All counties	≥ 0.1
HRVOCs[d]	Nonattainment counties	≥ 0.1
COIs[e]	Nonattainment counties	≥ 0.1
Total VOCs[f]	East of 100° longitude, El Paso	≥ 5, 90% speciation required
	West of 100° longitude, except El Paso	≥ 25, 90% speciation required
PM, PM_{10}, $PM_{2.5}$	All counties	Speciate particulate classes.
Chemical Mixtures	All counties	Use the most specific contaminant code possible for chemical mixtures such as condensate (*59090*), crude oil (*59001*) and gasoline (*59003*). When using chemical mixtures, speciate HAPs and other species first, then report the unspeciated remainder under the applicable code.
IC Engines	All counties	Report all HAPs ≥ 0.1 tpy *Note:* formaldehyde is typically ≥ 0.1 tpy when the total VOCs are ≥ 2 tpy.

[a] HAPs—*Hazardous air pollutants* as identified at federal Clean Air Act 115(b).
[b] A registered permit by rule that includes a certification of federally enforceable emission limits (e.g., using Form PI-7 CERT, designated form TCEQ-20182) is a TCEQ-enforceable document.
[c] Toxic—*Toxic air pollutants* as identified at 40 CFR 372.65.
[d] HRVOC—*Highly reactive volatile organic compounds* are, for inventory purposes, 1,3-butadiene, ethylene, propylene, and all isomers of butene.
[e] COI—Compounds of interest are, for inventory purposes: isoprene, all isomers of pentene, all isomers of trimethylbenzene, and all isomers of ethyltoluene.
[f] VOCs—*Volatile organic compounds* as defined in 30 TAC 101.1.

Reporting Emissions

Before entering emission rates on the EIQ, the annual emissions and the emissions resulting from emissions events or scheduled maintenance, startup, and shutdown activities must be determined. Depending on the site’s location, the daily emission rates for the ozone season may need to be determined. Then the emissions are reported in the EI.

Annual Emissions

Annual emissions include all of a site's actual annual emissions associated with authorized (routine) operations, maintenance, startup, and shutdown activities. **It does not include emissions that are defined in 30 TAC 101.1 as emissions events or (non-authorized) scheduled maintenance, startup, and shutdown activities.** Determine and speciate annual emissions according to the guidance in this chapter and the technical supplements. The reporting year is the calendar year for the EI.

Ozone Season Emissions

If the regulated entity is located in El Paso County or east of the 100° longitude line (see Table 4-5 for those counties), the average daily release rates during the ozone season—May 1 through September 30—must be determined. The ozone season emissions must be reported in pounds per day (ppd) under the "Ozone" heading on the Path Emissions portion of the EIQ. The EAS database can no longer automatically calculate ozone rates.

For each FIN/EPN path, use actual process or emissions data (or both) gathered during the ozone season to determine total ozone season emission rates. For example, for a combustion source, determine total ozone season emissions contaminant by contaminant from the amount of fuel burned from May 1 through September 30. For sources equipped with CEMS, determine total ozone season emissions from CEMS data gathered from May 1 through September 30.

For each FIN/EPN path, quantify every contaminant's total ozone season emissions (in pounds). **Do not include emissions events or scheduled maintenance, startup, and shutdown emissions in total ozone season emissions.** However, authorized maintenance, startup, and shutdown emissions that are included in the annual emissions rate must be accounted in the total ozone season emissions. Use the following equation to determine the FIN/EPN path's ppd emissions rates:

$$E_{ozone\,rate} = \frac{E_{ozone\,total}\ (\text{lbs})}{153\ \text{days}}$$

Where:

$E_{ozone\ rate}$ = ppd (pounds per day) ozone rate for one contaminant

$E_{ozone\ total}$ = total pounds of contaminant emitted during the ozone season

Table 4-5. Ozone Season Daily Rates Are Required from Sites in These Counties

Note: The EAS database cannot calculate ozone rates.

Anderson	Duval	Karnes	Red River
Angelina	Eastland	Kaufman	Refugio
Aransas	El Paso	Kendall	Robertson
Archer	Ellis	Kenedy	Rockwall
Atascosa	Erath	Kerr	Runnels
Austin	Falls	Kimble	Rusk
Bandera	Fannin	Kleberg	Sabine
Bastrop	Fayette	Knox	San Augustine
Baylor	Foard	La Salle	San Jacinto
Bee	Fort Bend	Lamar	San Patricio
Bell	Franklin	Lampasas	San Saba
Bexar	Freestone	Lavaca	Shackelford
Blanco	Frio	Lee	Shelby
Bosque	Galveston	Leon	Smith
Bowie	Gillespie	Liberty	Somervell
Brazoria	Goliad	Limestone	Starr
Brazos	Gonzales	Live Oak	Stephens
Brooks	Grayson	Llano	Tarrant
Brown	Gregg	Madison	Taylor
Burleson	Grimes	Marion	Throckmorton
Burnet	Guadalupe	Mason	Titus
Caldwell	Hamilton	Matagorda	Travis
Calhoun	Hardeman	McCulloch	Trinity
Callahan	Hardin	McLennan	Tyler
Cameron	Harris	McMullen	Upshur
Camp	Harrison	Medina	Uvalde
Cass	Haskell	Menard	Van Zandt
Chambers	Hays	Milam	Victoria
Cherokee	Henderson	Mills	Walker
Clay	Hidalgo	Montague	Waller
Coleman	Hill	Montgomery	Washington
Collin	Hood	Morris	Webb
Colorado	Hopkins	Nacogdoches	Wharton
Comal	Houston	Navarro	Wichita
Comanche	Hunt	Newton	Wilbarger
Concho	Jack	Nueces	Willacy
Cooke	Jackson	Orange	Williamson
Coryell	Jasper	Palo Pinto	Wilson
Dallas	Jefferson	Panola	Wise
DeWitt	Jim Hogg	Parker	Wood
Delta	Jim Wells	Polk	Young
Denton	Johnson	Rains	Zapata
Dimmit	Jones	Real	Zavala

Depending on the type of source, there may be many ways to determine $E_{ozone\ total}$ in the equation above. Use the method that gives the most accurate estimate of the actual emissions during the ozone season. Make sure to account for parameters that may cause emissions to vary in the ozone season such as fuel usage, chemical vapor pressures, storage temperature, operating schedule, and material usage.

For example, an emergency generator or fire pump is tested quarterly but otherwise remains idle. During the one-day July test, the unit emits 1,000 pounds of NO_x. However, those emissions must **not** be reported as 1000 pounds per day. Rather, they must be averaged over 153 days, resulting in ozone season emissions of 6.535 pounds per day.

Emissions Events (EE)

Report emissions events separately under the “EE” column on the “Path Emissions” portion of the EIQ. Include the emissions in tons per year from all releases due to emissions events, regardless of whether those releases represent reportable or nonreportable quantities and regardless of whether an affirmative defense is claimed for those emissions. The emissions thresholds specified in Chapter 3 of this document do not apply to emissions events. Emissions from any emissions event must be reported. For more information, consult 30 TAC 101.1 and 101.201.

EE emissions from sources that do not meet the requirements to be included individually in an EI are still required to be reported to the TCEQ (see Chapter 3 for more information). For sources controlled by an abatement device, such as a flare, the emissions may be reported at the flare facility. The emissions may also be reported at an associated facility (such as a piping-component-fugitive area). Otherwise, these sources can be added to the EI as a collective source. Consult Chapter 3 for more guidance about collective sources.

For guidance on interpreting rules concerning emissions events, contact the TCEQ’s Air Section manager for the region where the regulated entity is located. Additional guidance can also be found at the EAS Web page <www.tceq.texas.gov/goto/ieas>.

Excess Opacity Events

Emissions that occur during excess opacity events must be quantified and reported in the EI. However, the excess opacity event itself cannot be reported in terms of percent opacity in the EI, even if it was permitted as a percentage. Rather, the emissions associated with the event must be calculated and reported in the “Emissions Event” column of a specific path as a mass quantity (in terms of tons), using the best emissions determination method available, such as process knowledge, past engineering analysis, or testing.

Certification Statement

Under Texas Health and Safety Code 382.0215(f), an owner or operator of a regulated entity that experienced no emissions events during the relevant calendar year must include, as part of the reported inventory, a signed statement certifying that the regulated entity experienced no emissions events during the reporting year.

The certification is also required for regulated entities that experienced one or more excess opacity events but did not experience any emissions events.

Scheduled Maintenance, Startup, and Shutdown (SMSS) Activities

Report emissions from scheduled maintenance, startup, and shutdown activities separately under the “SMSS” column on the “Path Emissions” portion of the EIQ. Report the annual emissions in tons from all releases due to scheduled maintenance, startup, and shutdown activities that are **not** authorized by a new source review permit or permit by rule in the “SMSS” column, regardless of whether those releases represent reportable or nonreportable quantities and regardless of whether an affirmative defense is claimed for those emissions. The emissions thresholds specified in Chapter 3 of this document do not apply to emissions events. Emissions from any emissions event above 0 tons per year must be reported. For more information, consult 30 TAC 101.1 and 101.211.

Note: Emissions from maintenance, startup, and shutdown activities that are authorized under a permit or permit by rule must be reported in the “Annual” column and not included in the “SMSS” column.

For guidance on interpreting rules concerning scheduled maintenance, startup, and shutdown activities, contact the TCEQ’s Air Section manager in the region where the regulated entity is located.

Additional guidance can also be found at the EAS Web page: <www.tceq.texas.gov/goto/ieas>.

Special Note: “EE/SMSS” Column

As outlined in the previous section, emissions from emissions events and SMSS activities must be reported in either the “EE” or the “SMSS” column, as appropriate. An owner or operator of a regulated entity that reports emissions in the “EE/SMSS” (totals) column must also report emissions in the “EE” or “SMSS” column (or both), as appropriate.